

Stat 4201: Introduction to Mathematical Statistics I

Instructor: Prof. Ali Miller
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Lecture Location: KN 0250
Lecture Time: MWF 3:00pm-3:50p

Required Text: John E. Freund's Mathematical Statistics (8th edition) by I. Miller and M. Miller, Pearson 2012.

College of Arts and Sciences GE Requirements Stat 4201 is a Data Analysis course in the Quantitative and Logical Skills category of the GE Requirements.

Expected Learning Outcomes Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

Course Description: Statistics 4201 is the first course in a two-quarter sequence on probability and mathematical statistics. It aims to introduce basic concepts in mathematical statistics, including probability, discrete and continuous distributions and densities, mathematical expectation, functions of random variables, transformation techniques, sampling distributions, order statistics.

Website: Please visit <http://www.carmen.osu.edu/>. Check Carmen periodically for announcements about the class and other class material.

Recitation Recitations are an integral part of this course. Our TAs will spend time going over examples, and answering questions about the course material. At other times, the TA may cover material that is not covered in lecture.

Homework: There will be 13 homework assignments worth 10 points each with the three lowest scores being dropped. You need to show justification for your answer on each homework problem to receive full credit. Homework problems and solutions will be posted on Carmen. No late homework will be accepted. If you do not turn in a homework assignment on time, that will count as one of your dropped scores. Homework is due at the end of lectures on Wednesdays.

Exams: There will be two in-class exams and a comprehensive final. The exam dates are provided on the schedule attached to this syllabus. Statistical tables will be provided as needed. Calculators may be used on the exams, but the calculators on cell phones, PDAs, or any other communication device are NOT allowed.

Notes for use on the exams: You may use one 8.5 x 11 inch sheet of paper (both sides), with whatever **handwritten** facts, formulas, or explanations you find helpful. For the final, you may bring two sheets.

Makeup Exams: If you absolutely need a makeup exam and have a valid excuse, please see me (not your recitation instructor) for the necessary arrangements. However, you **must notify me at least a week in advance** in such a situation. A make-up exam may be a bit harder than the regularly scheduled exam and must be taken within a week of the missed exam. Exceptions to this policy will be permitted only in extreme situations such as serious injury immediately prior to an exam or **severe** illness requiring hospitalization.

Final Grade: Your final course grade will be based on the following weighting of assessment components: Homework = 20%, Exams = 25% each (50% total), Final = 30%. The following rubric will be used for determining final grades:

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	E
Min %	92%	89%	87%	82%	79%	76%	71%	66%	61%	51%	<51%

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

E-mail Correspondence: In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.nn account.

Special Accommodations: “Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Note: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advanced notice.

Date	Lecture Topic	Textbook
1/11	Intro. to Probability, Review of combinations and permutations	1, 2.1-2.4
1/13	Probability rules; Conditional probability	2.4-2.5
1/15	Conditional probability; Independent events	2.6-2.7
1/18	No Class (MLK Day)	
1/20	Bayes' Theorem	2.8
1/22	Random variables and probability distributions	3.1-3.2
1/25	Continuous random variables, Probability Density Functions	3.3-3.4
1/27	Multivariate distributions	3.5
1/29	Marginal and conditional distributions	3.6-3.7
2/1	Expected Value	4.1-4.2
2/3	Moments and moment-generating functions	4.3, 4.5
2/5	Moment- generating functions and product moments	4.5-4.6
2/8	Product Moments	4.6
2/10	Review	
2/12	Exam I	
2/15	Moments of linear combinations of random variables	4.7
2/17	Conditional expectations	4.8
2/19	Discrete uniform, Bernoulli distributions	5.1-5.3
2/22	Binomial Distribution	5.4
2/24	Negative Binomial and Geometric distributions	5.5
2/26	Hypergeometric distribution	5.6
2/29	Poisson distribution	5.7
3/2	Multinomial distribution	5.8
3/4	Continuous density functions, Uniform distribution	6.1-6.2
3/7	Gamma, Exponential distributions, Chi-Square distributions	6.3
3/9	Beta, Weibull, and Pareto Distributions	6.4
3/11	Normal Distribution	6.5
3/14	Normal Approximation to the Binomial	6.6
3/16	No Class (Spring Break)	
3/18	No Class (Spring Break)	
3/21	No Class (Spring Break)	
3/23	Review	
3/25	Exam II	
3/28	Functions of random variables; distribution function technique	7.1-7.2
3/30	Transformation techniques: one variable	7.3
4/1	Transformation techniques: one and two variables	7.3-7.4
4/4	Transformation techniques: two variables	7.4
4/6	Moment generating function technique	7.5
4/8	Sampling distributions; Sampling distribution of the mean	8.1-8.2
4/11	Sampling Distribution of the mean; Central Limit Theorem	8.2
4/13	Distribution of mean in finite populations	8.3
4/15	Chi-Square distribution	8.4
4/18	t-distribution, F-Distribution	8.5-8.6
4/20	Order Statistics	8.7
4/22	Review	
4/25	Reading Day	
4/29 4:00pm	Cumulative Final Exam	